PATENT

IN THE INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY
EUROPEAN PATENT OFFICE

In the **PCT APPLICATION** of:

General Instrument Corporation

Application No.: PCT/US99/28232

Filed: 30 November 1999

For: UNIVERSAL MODULATOR

Authorized Officer: H-V Fritzsche

Our File: MOT-D2174WO

Date: 28 November 2000

21 PAGES VIA FACSIMILE TO 011-49-89-2399-4465 ORIGINAL TO FOLLOW VIA FEDERAL EXPRESS

REPLY TO FIRST WRITTEN OPINION WITH ARTICLE 34 AMENDMENT

IPEA-EPO
D-80298 Munich
GERMANY

Sir:

This Reply is responsive to the Written Opinion dated 28 August 2000. Pursuant to Article 34, please amend the application by substituting new pages 2-2A in the Background for existing page 2; and new pages 21-25 in the claims for existing pages 21-24, and new page 25 of the Abstract for existing page 26.

The Background has been revised to incorporate the art disclosed in document D1-D3.

The Abstract has not been revised. However, due to changes to the claims, a substitute sheet 25 for the Abstract is included herewith for consecutive numbering of the pages.

The claims have been revised to add reference numerals as requested and to address the other informalities raised by the Examiner. A marked-up copy of all the substitute sheets numbered 1-7 indicating inserted material with underscoring, and

deleted material with brackets is attached hereto, which illustrates the changes made in the substitute sheets. Applicant believes that all informalities raised by the Examiner in the Written Opinion have been addressed.

With respect to the Examiner's rejection of claim 12 as not meeting the requirements of Article 33(2) in view of reference D1 as discussed in Item V, paragraph 1 of the Written Opinion, we respectfully disagree. Reference D1 discloses a multiple conversion receiver system capable of avoiding receiver spurs by combined switching of multiple local oscillator frequencies, including combinations of high-side and low-side injection and IF switching. As disclosed in column 5, lines 50-55:

> This is accomplished by calculating what first and second local oscillator frequency combinations will cause spurs and then ensuring that the first IF and/or second oscillator frequencies are switched so that these frequency combinations do not occur...

The local oscillator frequencies are selected in different manners. The first oscillator frequency is selected based on whether the first IF frequency should be set for 1025 MHz or 1040 MHz. The second oscillator frequency is selected to be either 978 MHz or 1087 MHz, (see column 8, lines 12-20). This section of the reference D1 reveals that the first oscillator frequency and the second oscillator frequency are only able to switch between <u>two predetermined frequencies</u>.

Additionally, in reference D1, adjustment to the first and/or second local oscillator(s) by a predetermined value may fail to remove the interference from the output of the system. This is disclosed in column 7, lines 45-56:

> If the first IF frequency is changed from 1040 MHz to 1025 MHz, and the local oscillator frequencies are likewise decreased (by 15 MHz) to keep the receiver tuned to 94 MHz, there will still be a spur generated from the first harmonic of the first local oscillator and the second harmonic of the second local oscillator because Equation 1 remains satisfied:
>
> I(1119)=2(1073)-1025
>
> Thus, <u>changing only the IF frequency is not sufficient when the unit is tuned to 94 MHz</u>.

(Emphasis added). Accordingly, the oscillator frequency adjustment method <u>may not eliminate the unwanted interference</u>. Since the system disclosed in reference D1 is unable to eliminate the interference by adjusting the first and second oscillators, another method is employed. The second method disclosed by the reference D1 switches the second local oscillator from high-side to low-side injection (from 1087 MHz to 993 MHz). The examples disclosed in column 5, line 64 - column 8, line 11 demonstrate that the system of reference D1 employs <u>two</u> methods for eliminating interference. Since neither method individually, is able to eliminate all interference, the system requires the implementation of both methods, each of which includes predetermined values for the first and second local oscillator.

In contrast, the present invention calculates a delta value. This delta value, which is <u>not predetermined</u>, is the basis to change the frequency of both the second and third local oscillators and frequency translate the ODBFs outside of the selected IF bandwidth. The system then adjusts <u>both</u> local oscillators from their initial frequencies to their new frequencies based upon the delta value. The frequencies of the second and third oscillators are not limited to two predetermined frequencies, as

disclosed on page 8, line 21 - page 9, line 4 and page 11, lines 20-28. Once the frequencies have been chosen for each oscillator, any adjustments are uniformly applied to the oscillators in accordance with the delta value. Implementing a single method of uniformly moving both the second and third local oscillators to new operating frequencies by the same delta value, the present invention provides the maximum amount of flexibility for eliminating the ODBFs within the selected IF bandwidth.

It is respectfully asserted that reference 1 teaches away from the present invention by requiring the implementation of two methods in which neither method individually is able to eliminate all ODBFs within the selected IF bandwidth, and requiring only two predetermined frequencies for each local oscillator in which the second oscillator frequency can be independently adjusted (high-side to low-side injection). Therefore, the subject matter of claim 12 is novel and includes an inventive step in view of reference D1.

With respect to the Examiner's rejection of claim 1 as being anticipated by reference D1, reference D2 and reference D3 in Item V, paragraph 2 of the Written Opinion, we respectfully disagree. For the reasons stated above, reference D1 does not disclose all of the features of claim 1 in the present invention. Regarding reference D2, this reference teaches a receiver circuit which adjusts the oscillator frequency of the first and second oscillator by a predetermined amount upon the detection of an ODBF. (see page 2, lines 26 and 27). The system of reference D2 also discloses on page 3, lines 23-26:

> Up until now, it was common and necessary in performing double conversions to have to target the first ZF above the frequency band to be received so that singing points arising from oscillators configured accordingly are prevented. This is not necessary when using the invention.

As stated above, the present invention calculates an adjustment delta value which is the basis to change the frequency of the second and third oscillator. This delta value is not predetermined. Also, the system of the present invention generates a first frequency from mixing with an input RF signal to generate a high intermediate frequency (HI-IF) signal, which is targeted above the frequency band received. This HI-IF signal is then mixed with a second frequency to generate the desired RF output signal. As such, the features of the invention as presently claimed are not disclosed in reference D2 since reference D2 requires the adjustment of the oscillator frequencies by a predetermined amount and eliminates the need to target the first IF above the frequency band to be received.

Regarding reference D3, the system disclosed in reference D3 teaches the use of a first local oscillator for generating any one of a number of predetermined frequencies and a second local oscillator for generating one of two frequencies to avoid receiver self-quieting spurious responses, (see Abstract and page 11, lines 3-24). The second local oscillator frequency is selected in order to eliminate the receiver self-quieting spurious responses. Contrary to reference D3, the invention as presently claimed, teaches the use of two frequency agile local oscillators which can generate any frequency required to obtain the desired output signal. Both of the local oscillator frequencies are adjusted by an adjustment delta value to eliminate all

ODBFs. Therefore, reference D3 does not disclose all of the features of claim 1 of the present invention.

All of the above-cited references D1, D2 and D3 teach away from the present invention. Reference D1 requires the implementation of two methods in which neither method individually is able to eliminate all ODBFs within the selected IF bandwidth, and requires only two predetermined frequencies for each local oscillator in which the second oscillator frequency can be <u>independently</u> adjusted (hi-side to low-side injection). Reference D2 requires the adjustment of the oscillator frequencies by a <u>predetermined amount</u>. An object of the reference D2 system was to eliminate the need to target the first IF above the frequency band to be received. Reference D3 teaches the use of two local oscillators that generate predetermined frequencies, in which only the second local oscillator is selected between one of two frequencies to eliminate the spurious responses. Therefore, it is respectfully submitted that references D1, D2 and D3 do not teach all of the features of claim 1.

With respect to the Examiner's finding that the features of claim 11 are known from reference D1, we respectfully disagree. As stated in the Applicant's response to paragraph 1, Item V, reference D1 teaches the use of a first and second local oscillator in which both oscillators may be adjusted a predetermined amount. This reference also teaches the use of a second method of adjustment when the predetermined adjustment fails to rid the system of the interference. This second method allows for the second oscillator to be adjusted independent of the first oscillator. The system taught by claim 11 utilizes three frequency agile synthesizers

to generate a desired RF output signal in which the second and third frequencies generated by the second and third frequency synthesizers are adjusted by a calculated delta value, eliminating the interference from the RF output signal. Therefore, all of the features of the invention defined by claim 11 are not found in reference D1.

It is respectfully submitted that the claims satisfy the novelty, inventive step and industrial applicability requirements. In the event that a negative statement with respect to the new claims is made applicant respectfully request an additional opportunity to respond pursuant to Rule 66.4(b).

Respectfully submitted,

General Instrument Corporation

By________________________
Gerald B. Halt, Jr., Esquire
(215) 568-6400

Volpe and Koenig, P.C.
Suite 400 One Penn Center
1617 John F. Kennedy Boulevard
Philadelphia, PA 19103

GBH/DWS/ras
Enclosures